

FIG. 1 FLOW-BLOCK DIAGRAM THAT CHARACTERIZES THE DESIGN CONCEPTS OF THE ALLOYS OF THE INVENTION

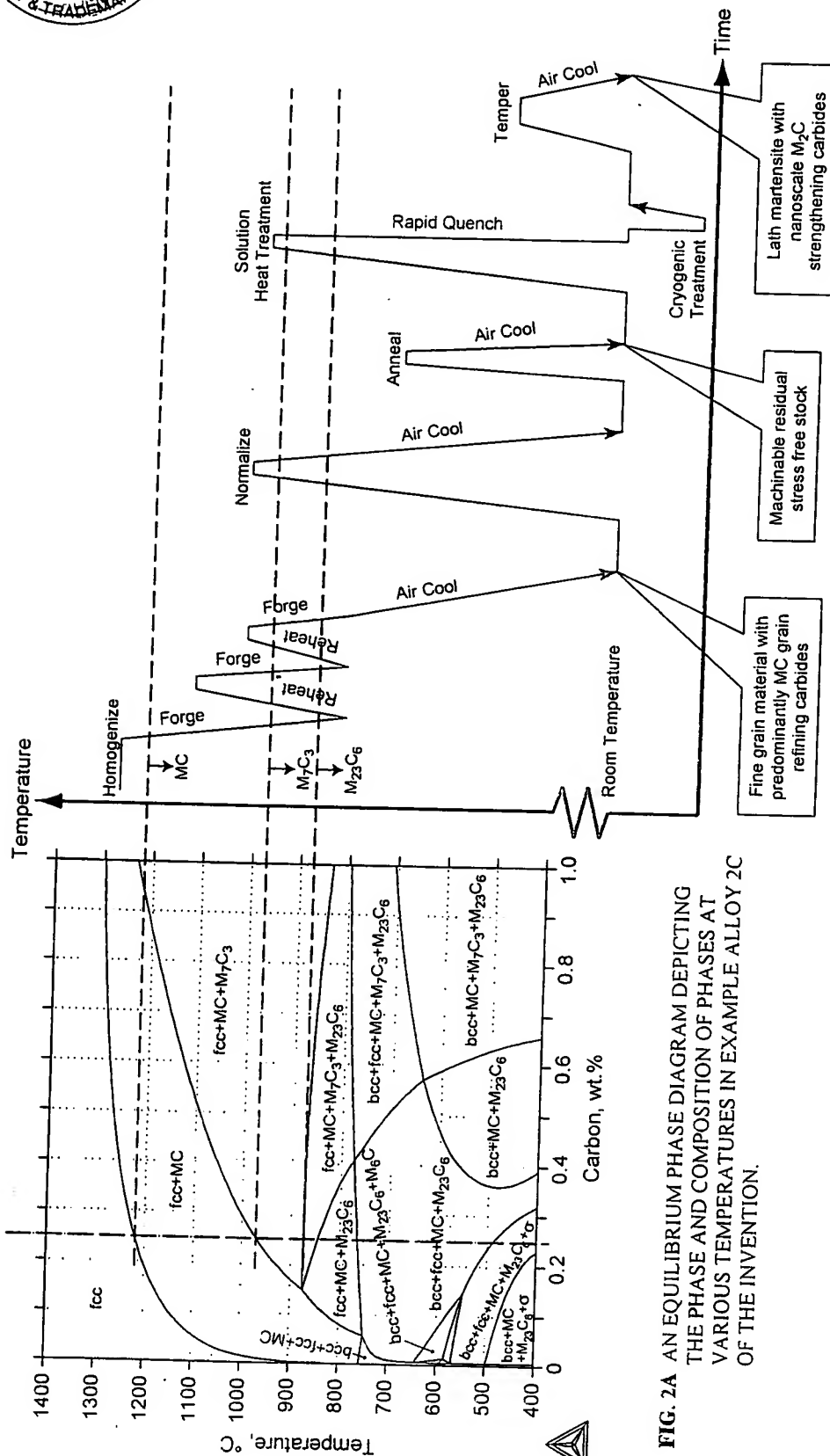


FIG. 2B A DIAGRAM OF THE TYPICAL PROCESSING PATH FOR ALLOYS OF THE INVENTION IN RELATION TO THE EQUILIBRIUM PHASES PRESENT.



NANOCARBIDE PRECIPITATION STRENGTHENED ULTRAHIGH-STRENGTH CORROSION RESISTANT, STRUCTURAL STEELS

Inventors: Kuehmann et al. - Serial No. 10/071,688

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REPLACEMENT SHEET

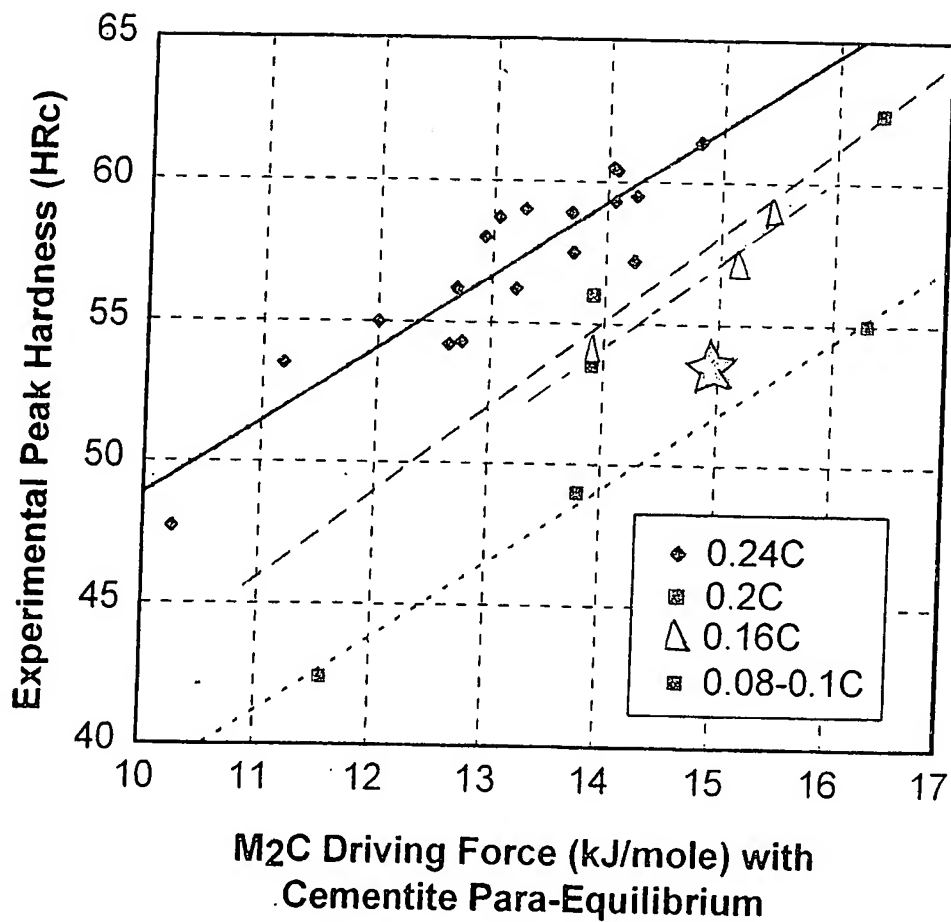


FIG. 3 CORRELATION BETWEEN PEAK HARDNESS AND M₂C DRIVING FORCES FOR VARYING CARBON (C) CONTENT.

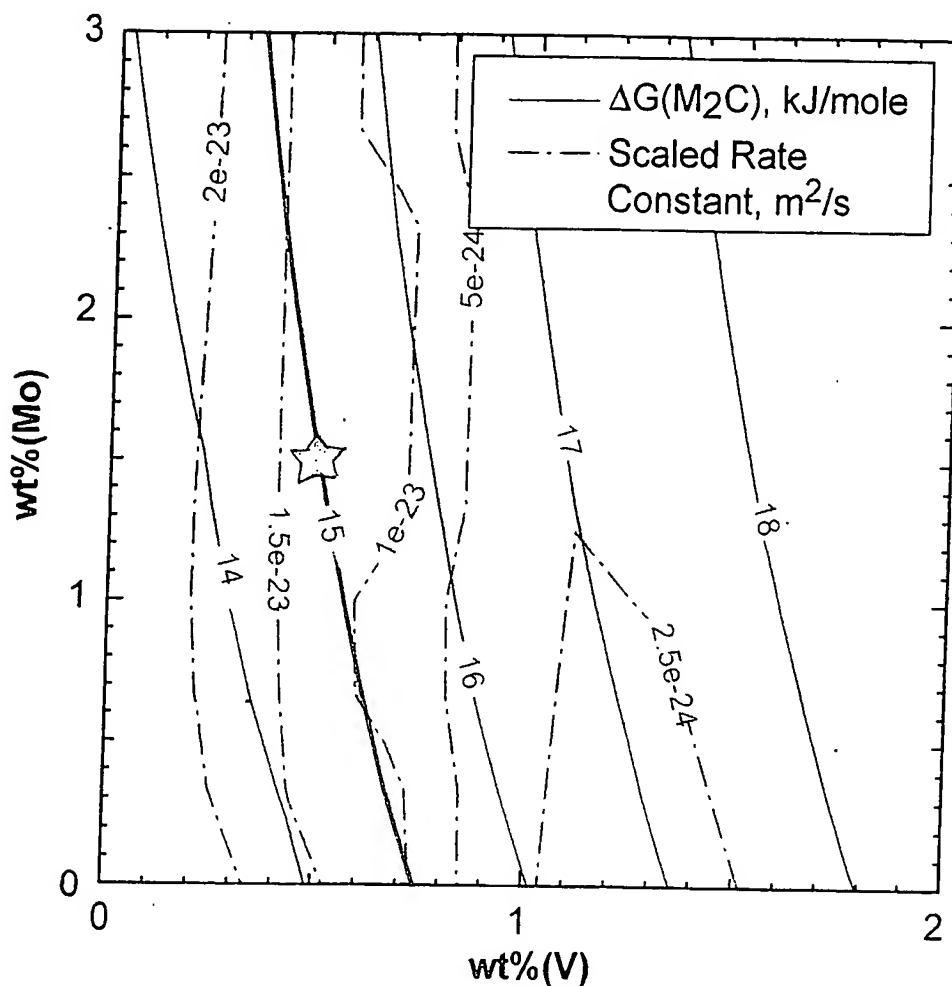


FIG. 4 CONTOURS OF M_2C DRIVING FORCE (ΔG) AND SCALED RATE CONSTANT FOR VARYING MOLBDENUM (Mo) AND VANADIUM (V) CONTENTS, WHERE TEMPERATURE HAS BEEN SET TO $482^\circ C$, AND AMOUNTS OF OTHER ALLOYING ELEMENTS HAVE BEEN SET TO, BY WEIGHT, 0.14% C, 9% Cr, 13% Co, AND 4.8% Ni.

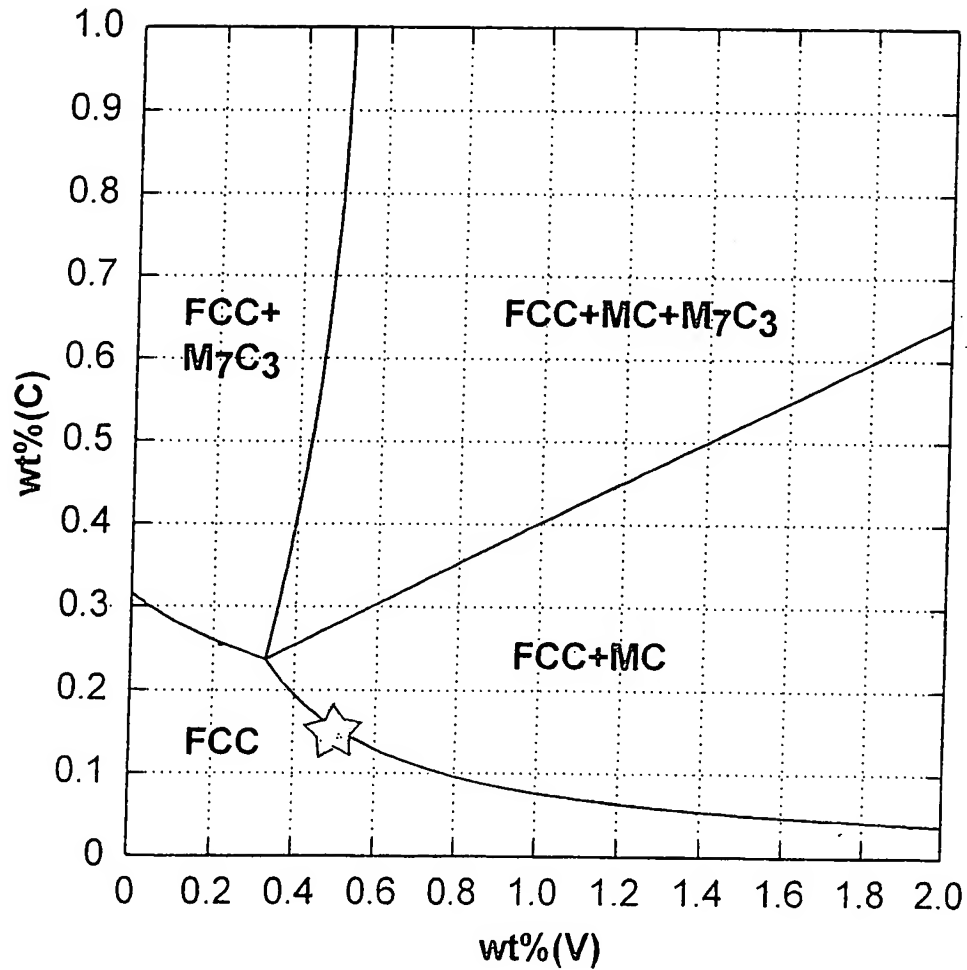


FIG. 5 PHASE DIAGRAM AT 1000°C USED TO DETERMINE FINAL VANADIUM (V) CONTENT FOR A CARBON (C) CONTENT OF 0.14% BY WEIGHT, WHERE OTHER ALLOYING ELEMENTS HAVE BEEN SET TO, BY WEIGHT, 9% Cr, 1.5% Mo, 13% Co, AND 4.8% Ni.

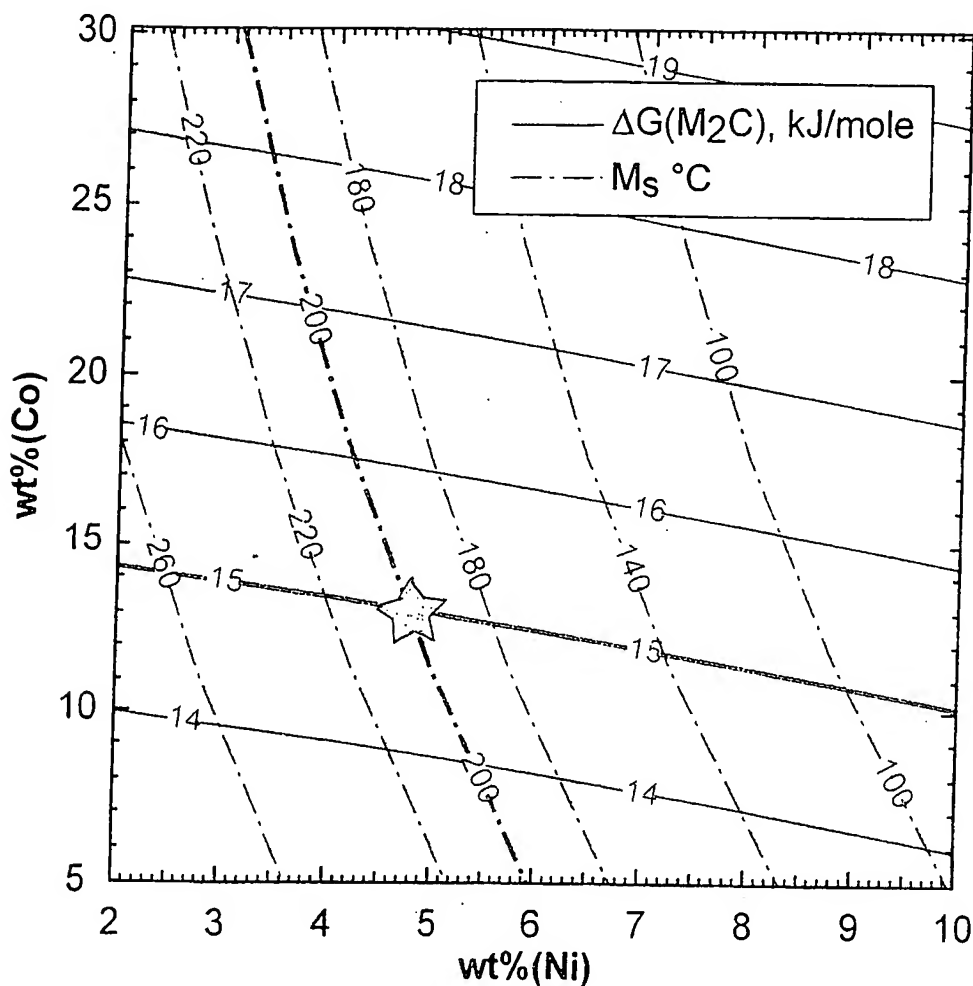


FIG. 6 CONTOURS OF M_s TEMPERATURE AND M_2C DRIVING FORCE (ΔG) FOR VARYING COBALT (Co) AND NICKEL (Ni) CONTENTS, WHERE TEMPERATURE HAS BEEN SET TO 482°C, AND OTHER ALLOYING ELEMENT AMOUNTS HAVE BEEN SET TO, BY WEIGHT, 0.14% C, 9% Cr, 1.5% Mo, AND 0.5% V.

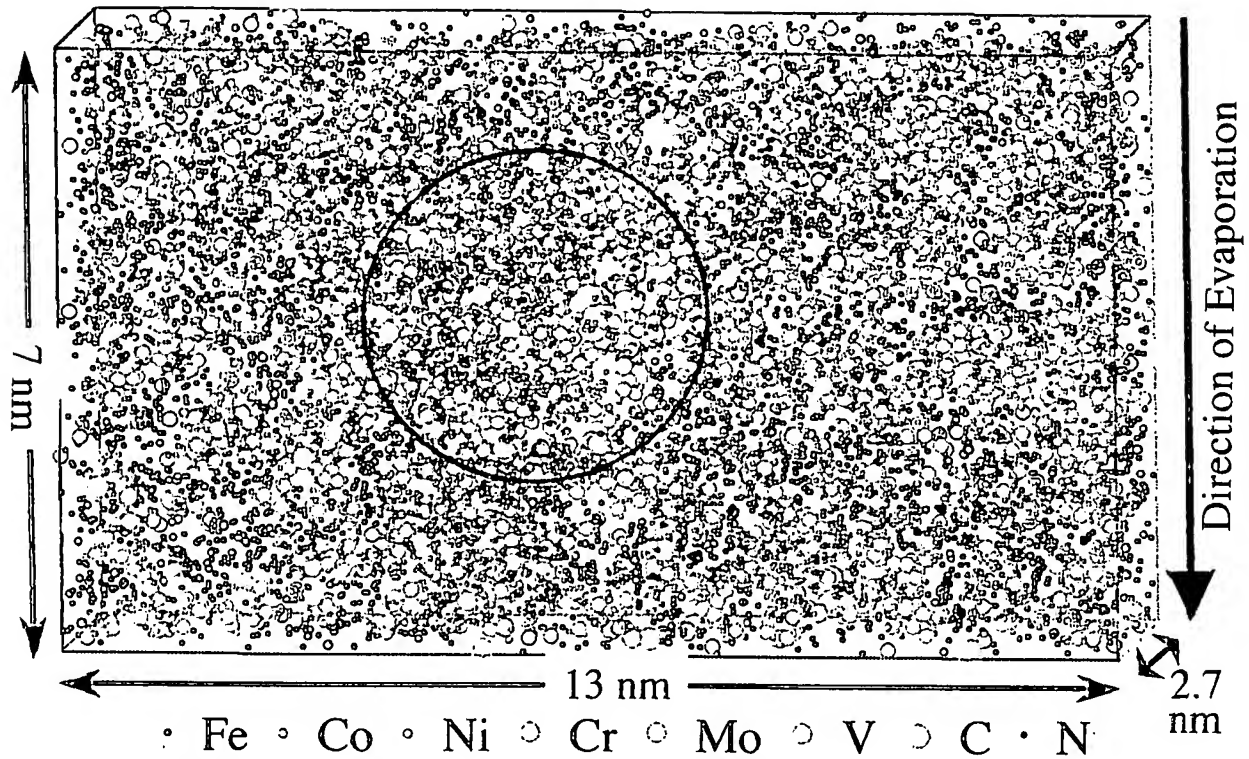


FIG. 7 3-DIMENSIONAL ATOM-PROBE IMAGE OF AN M_2C CARBIDE OPTIMALLY HEAT TREATED TO 3 nm DIAMETER IN EXAMPLE ALLOY 2C.

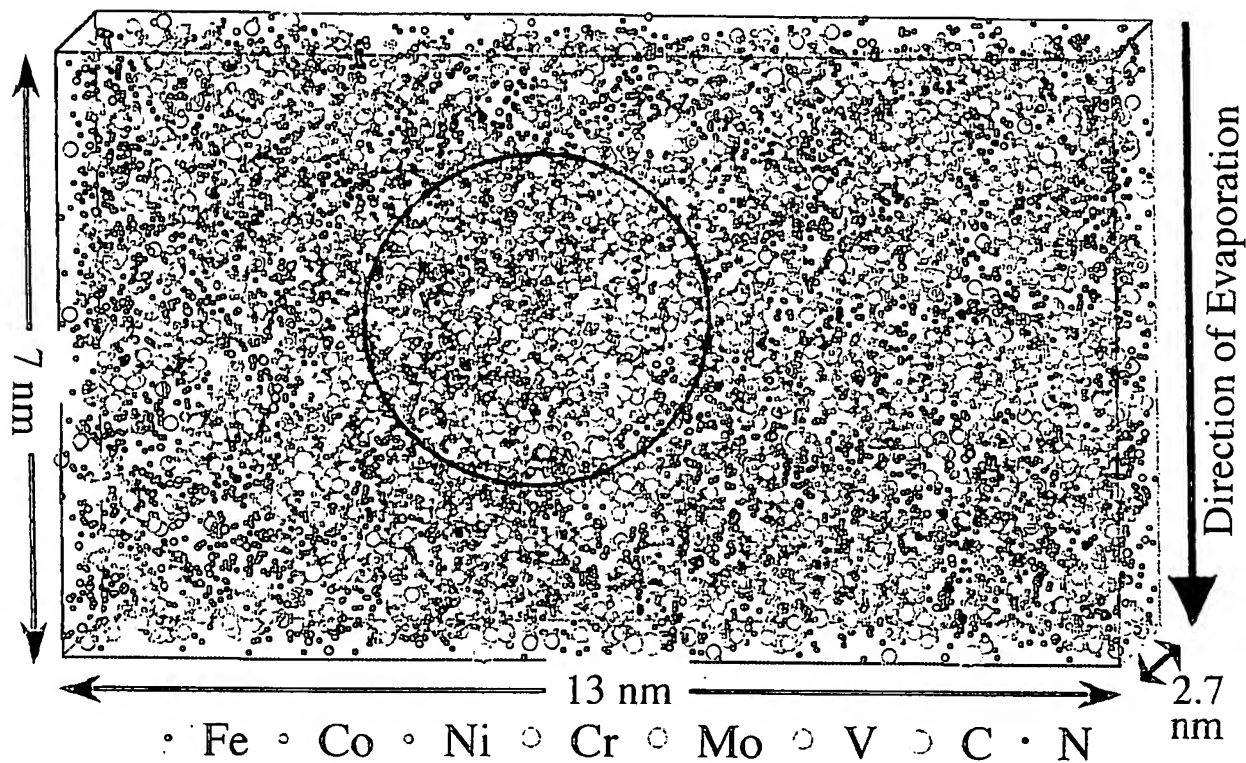


FIG. 7 3-DIMENSIONAL ATOM-PROBE IMAGE OF AN M_2C CARBIDE OPTIMALLY HEAT TREATED TO 3 nm DIAMETER IN EXAMPLE ALLOY 2C.

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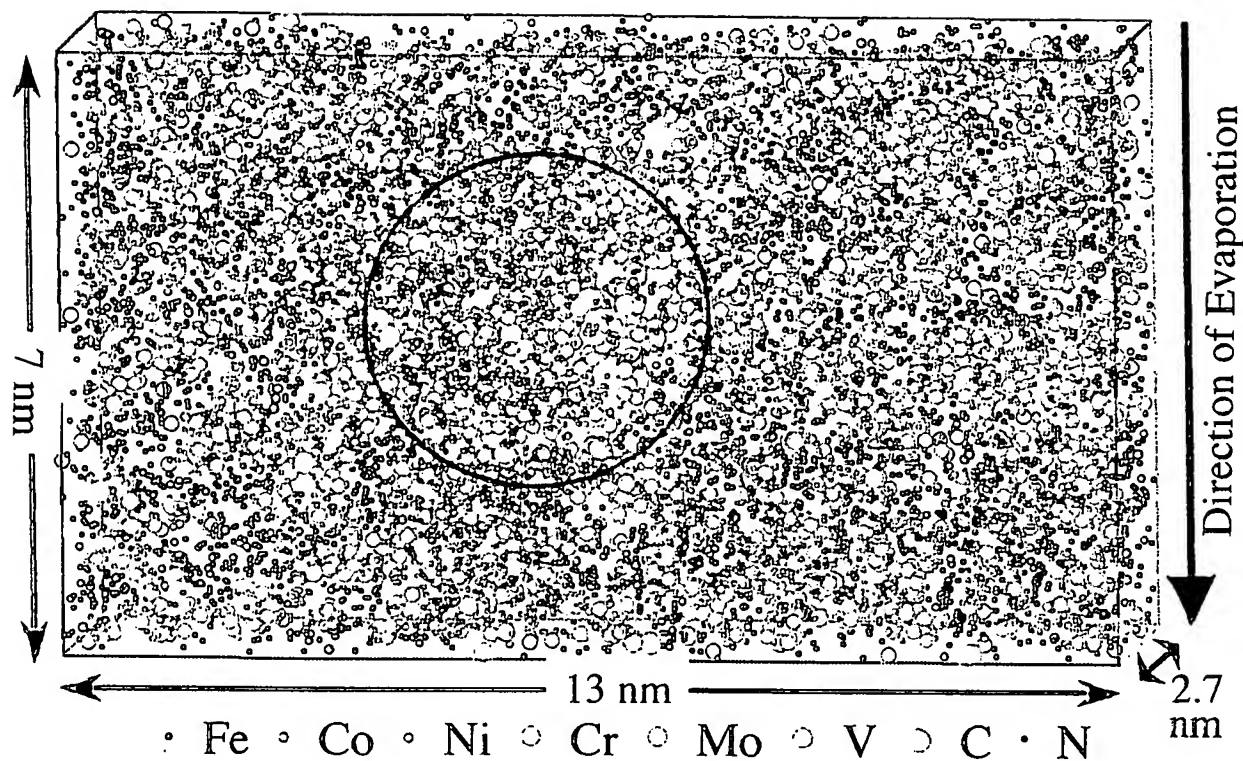


FIG. 7 3-DIMENSIONAL ATOM-PROBE IMAGE OF AN M_2C CARBIDE OPTIMALLY HEAT TREATED TO 3 nm DIAMETER IN EXAMPLE ALLOY 2C.